



Organisation
der Vereinten Nationen
für Bildung, Wissenschaft
und Kultur



• Harz - Braunschweiger
• Land - Ostfalen
• UNESCO
• Global Geopark

Landmark **4**

Brocken



 **GEO PARK**®
Harz . Braunschweiger Land . Ostfalen

Harz



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UNESCO
Global Geopark

On the 17th of November, 2015, during the 38th UNESCO General Assembly, the 195 member states of the United Nations resolved to introduce a new title. As a result, Geoparks can

be distinguished as **UNESCO Global Geoparks**.

As early as 2004, 25 European and Chinese Geoparks had founded the Global Geoparks Network (GGN). In autumn of that year Geopark Harz · Braunschweiger Land · Ostfalen became part of the network. In addition, there are various regional networks, among them the European Geoparks Network (EGN). These coordinate international cooperation.



In the above overview map you can see the locations of all UNESCO Global Geoparks in Europe, including UNESCO Global Geopark Harz · Braunschweiger Land · Ostfalen and the borders of its parts.

UNESCO-Geoparks are clearly defined, unique areas, in which geosites and landscapes of international geological importance are found. The purpose of every UNESCO-Geopark is to protect the geological heritage and to promote environmental education and sustainable regional development. Actions which can inflict considerable damage on geosites are forbidden by law.



1 A Highlight of a Harz Visit The Brocken

A walk up the Brocken can begin at many of the Landmark's Geopoints, or one can take the Brockenbahn from Wernigerode or Drei Annen-Hohne via Schierke up to the highest mountain of the Geopark (1,141 meters a.s.l.). On a walk around the Brocken summit, located above the natural timber-line, we encounter granite rocks called the Teufelskanzel (Devil's Pulpit) and the Hexenaltar (Witch's Altar) which were described by JOHANN WOLFGANG VON GOETHE (1749 – 1832). The "Dachgranit" (roof granite) of the Brocken massif is a biotite granite composed of medium sized crystal grains; the rocks are characterized by flat-lying joints dipping to the south. The exhibition in the Brockenhaus invites visitors to a voyage through time with



Teufelskanzel and Hexenaltar



Brocken visitor center

manifold impressions of the magic of the highest mountain in northern Germany. Over four floors of exhibition space, interesting facts about the history and nature of the mountain area with its unique geology, flora and fauna are presented. The tour begins with a virtual flight on a broomstick and follows the tracks of famous Brocken hikers, such as HEINRICH HEINE (1797 – 1856) or HERMANN LÖNS (1866 – 1914). Further themes of the visitor center include the military history as well as the building's function as an interception post of the GDR secret service Stasi – technology of this time is still installed within the building. Moreover, the Harz National Park is present in the center with valuable insights into the complex ecologic connections of the Brocken area. The value of the worldwide national park system is also presented for all age groups. On the way out to the dome's terrace, German broadcasting and television history is documented in a series of original exhibits from the time when "pictures learned to move". With a visit to the multimedia show and then the cafeteria, our tour in the Brockenhaus visitor center comes to an end.

2

Grown up since the last Ice Age Highmoors in the Upper Harz Region

The western Brocken shoulder belongs to the most rainy locations in Germany. The weather side is clearly of maritime character as a result of the westerly winds that drive the clouds into the area, leading to rainfall on the Brocken. Because of reduced evaporation rates as a consequence of the low mean annual temperature of 4° C and the given topographic characteristics of the area, excess waters are produced, a precondition for the development of highmoors. Like an hour glass, these areas are arched upwards towards their centre; for this reason they are called “highmoors”. In the region of the Brocken and its neighbouring Bruchberg there are nearly 871 hectares of bogs and bog spruces forests. In order to



TorfHaus



Geological exhibition

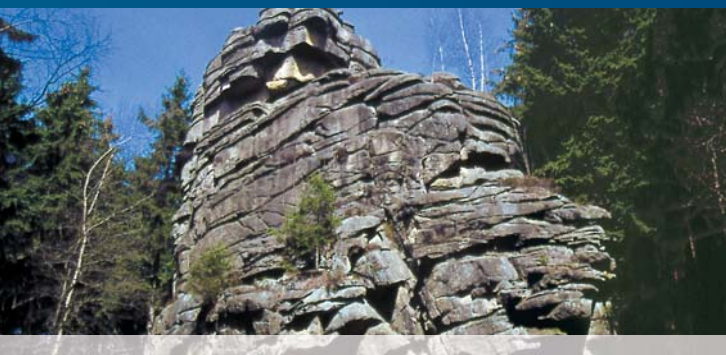
get an impression of this beautiful moorland we drive to Torfhaus. A tour is best begun with a visit to the National Park visitor center with its Geopark infopoint. Here one not only receives information how a moor develops. One part of the exhibition is about the geology of the Harz Mountains.

We begin with a short walk along the Goetheweg in the direction of the Brocken. On the left, we arrive at the Radauborn Moor, also called Großes Torfhausmoor. Wooden footbridges provided by the Harz National Park enable visitors to experience all the beauty of this unique highmoor. This region is the headwater source of the Radau, a tributary creek of the river Oker. The parallel Goetheweg and Abbegraben establish a man-made demarcation of the moor. The formation of the moor area began at the end of the last period of glaciation, and approximately 3,000 years ago the moor structure had already taken on its present dimensions, making it one of the oldest extensive highmoors of the Upper Harz range.

3

In the Headwater Region of the River Bode Feuersteinklippe

The small village of Schierke, a health and winter sport resort, is located southeast of the Brocken massif in the valley of the Kalte Bode (Cold Bode River). It is the ideal point of departure for excursions into the National Park Harz. The village has been a stop on the Harz narrow gauge steam railroad since the railway began service from Wernigerode to the Brocken in 1899. From the Schierke train station we begin our geological tour, starting with a short trip to a famous rock called the Feuersteinklippe. Already in 1784, Goethe was fascinated by the reddish granite rocks. On winding paths, or, in winter, preferably along a winter hiking trail starting at the Schierke train station, we walk towards the



Erdbeerkopf, following the trail signs to the Ahrensklint rock, 822 m a.s.l. The rock was originally known also as Arneklint or Adlerfels. Like the Feuersteinklippe rock, the Ahrensklint shows intense vertical and horizontal jointing, which came about during the cooling of the granite magma after its taking place in this mountain about 293 million years ago. Along these joints, weathering processes were at work, splitting the rock into rounded pieces which resemble so called “wool sacks”. This type of weathering – wool sack weathering – is typical for the local granite formations. The Ahrensklint rock is located near the Glashüttenweg, whose name indicates that in the Harz mountains the granite debris, rich in quartz, was converted into glass in a glasswork that was operated here from 1824 to 1843. From the top of the rock, there is a panoramic view to the Brocken, the Wurmberg, to Schierke, to the limestone quarries of Elbingerode and the Hohne Ridge. We return to Schierke (2,3 km) on the Pfarrstieg.



4

Granite and Hornfels

Oderteich and Rehberger Graben

Starting from the Oderteich on B 242, we walk southward along the Rehberger Graben to Sankt Andreasberg. The Oderteich, with a capacity of 1.7 million m³, and the 7 km long Rehberger Graben were constructed in order to supply the Sankt Andreasberg mines with the water necessary for operating mining machines. After few minutes, we arrive at a geological outcrop manifesting granite weathering. During the Tertiary period, warm, humid climates partially turned the potassium feldspar into kaolinite through the incorporation of water, which reduced the hardness of the granite and brought about its process of decomposition. This transformation did not take place uniformly. Parts of intact granite blocks were



Granite weathering



Contact at Goetheplatz

separated from those portions where the rock was already decomposed into grains of sand. The granite fabric has disintegrated to such an extent that only singular, large granite blocks "swim" in a sandy ground mass. We continue our walk and reach the Goetheplatz. The rocky cliffs to the right of the Rehberger Graben display the upper edge of the granite intrusion. Here older, metamorphically altered sedimentary rocks – "hornfels" – overlay the granite, which later intruded. This outcrop was visited by Goethe in 1783. From the Grabenweg our view descends into the deeply carved, steep-walled valley of the Oder river. On the opposite slope, large boulder fields – "Blockmeere" – are visible. At the bottom of the valley, the presence of moraine deposits as well as of blankets of debris, barrier silts and sands indicate that the Harz mountain range was, to some extent, affected by glaciation processes during the Pleistocene. The trail continues to the restaurant Rehberger Grabenhaus built in 1772. From here, we cross the Jordanshöhe on a path which has been converted into a petrographical educational trail leading to Sankt Andreasberg.



Tourist-Information Sankt Andreasberg

☎ 0049 5582 – 8033

www.oberharz.de

Samson Mine & National Park visitor center

Sankt Andreasberg is known as the mineralogical “treasury” of the Harz. There are approximately twenty, for the most part narrow, ore veins of sulfuric lead, zinc, copper ores and silver ore. This renowned region has yielded up a total of over 320 t of silver. The mining museum Samson consists of the entire complex of the above ground mining plant, closed in 1910 after long operation in a shaft for silver ore at a depth of 810 m. With the only Drahtseil-Fahrkunst, a cable elevator, still in duty in the world, the plant has been designated an international machine monument. Two giant water wheels convey a vivid impression of highly developed usage of water-driven technology. The mining shaft serves not



The Samson Mine



National Park visitor center

only as a museum but also as a source of regenerative water energy. The Gaipel – or shaft house – also contains a museum for Harz canary birds. More hands-on technology of mining can be experienced in the adjacent mining museum Catharina Neufang. A learning trail for geology and mining history along the Beerberg with its information panels leads us to numerous mining relics and helps introduce us to this cradle of silver mining. Here, in 1520, the first rich silver ores were discovered in Sankt Andreasberg. Near the Samson mine, at the Erzwäsche, a site where the Samson ore was washed and concentrated, we are invited in the Sankt Andreasberg National Park visitor center to a journey through time. A film transports us back millions of years to the period in which the Harz originated. We can experience how the forests and water resources were exploited in the past and learn how the natural environment is now beginning to recover in the Harz National Park. “Let nature be nature” is the motto of the park. A collection of ore minerals and rocks manifests the geological diversity of the Harz.



Glossary

Landmarks are points in the landscape or actual localities which are highly visible and well-known. They serve as an initial orientation in one of the largest Geoparks worldwide and give the specific areas their names. Every landmark area is represented in a special leaflet.

Geopoints are points of particular interest. At these points, the geological history of the area or the evolution of the cultural landscape are evident and can be conveyed to visitors. Geopoints are numbered in sequence within the region of a Landmark. They can be combined to constitute an individual Geo-Route. The Geopoint Nr. ① is always the place which has given its name to the Landmark.

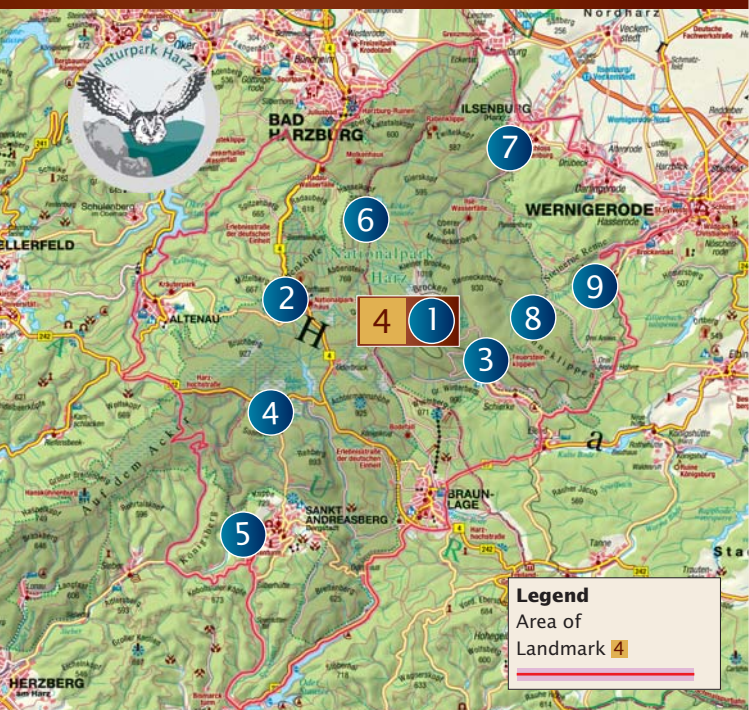
The map below will aid you with planning your own personal **Geo-Route** in the region of Landmark ④. The Harz National Park offers guided tours and invite to visit information centers.

Bestellung weiterer Faltblätter

Order leaflets in English

Information en français

www.harzregion.de

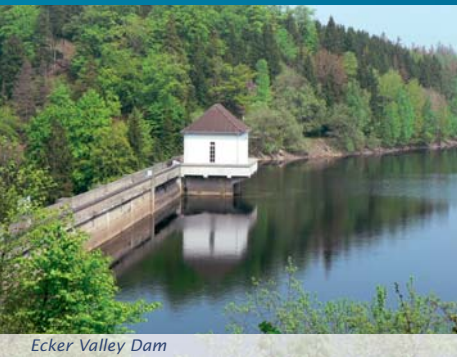


6

Into Former Borderlands

Ecker Valley Dam and Ecker Gneiss

South of the Radau Falls, we enter the Radau valley and can leave the car at the end of the public road. Hiking to the Ecker Dam, we pass the geological site of the Kohlebornskehre, where an information panel identifies and explains this point as an exposure of Harzburgite – an ultramafic rock type of the peridotite group. Harzburgite is composed predominately of serpentinized olivines and orthopyroxenes. Because of the intense reflexion of the orthopyroxen minerals, this rock is also called Schillerfels (glitter rock). The Ecker Valley Dam forms an artificial lake with the highest altitude of the lakes managed by the Harzwasserwerke. The dam wall, constructed of heavy concrete, is



Ecker Valley Dam



Border column

235 meters long, 65 meters high and resists through its own weight a water pressure of up to 420,000 tons. The lake's storage capacity is 13.3 million cubic meters. The dam was finished in 1942. At that time, the Ecker river divided the Prussian province of Saxonia in the east from that of Hanover in the west. As a consequence of World War II, this dam became part of the inner German border, and the frontier troops of the GDR erected a wall on top of it. One of the concrete border columns has been left standing as a reminder of these times. Along the Ecker Reservoir, metamorphic rocks are exposed: the Ecker Gneiss. These rocks were once considered to be the oldest rocks in the Harz, but according to new geological researches these gneisses are just of normal hercynian (variscan) age. They are part of the Harz basement rocks, but were metamorphically changed by high pressures and later the high temperatures of the rising gabbro melts here. Information panels near the barrage wall provide geological details. At the Ecker Dam wall we find a stamping station for the Harz Hiking Pin.

7

In the Ilse Valley National Park Community Ilseburg

Ilseburg is situated immediately on the Northern Harz Boundary Fault. OTTO III. (980 – 1002) had donated his fortress Elysynaburg to the diocese of Halberstadt. A cloister church constructed of Rogenstein was built 1078 – 1087 as a threenaved cruciform romanesque basilika on the grounds of the castle. The church contains unique fragments of a gypsum composition floor. Because the monks and the garrison troops were perpetually quarreling, members of the garrison erected a new citadel on the opposite granitic rock of the Ilsestein. In 1105, this building was destroyed. From this point on, the Ilseburg monastery evolved undisturbed into a cultural and economical centre of the northern Harz foreland. Depending



The Technical Museum



Cloister church

on the iron ore mines in the Harz, BOTHO III., count of Stolberg-Wernigerode (1467 – 1538), founded the Fürst Stolberg Smelter in 1530. In 1546, the first blast-furnace was constructed in Ilseburg. Because of the fame of Ilseburg's metallurgical industry, Tsar PETER I. (1682 – 1725) made a short detour during his legendary voyage to Holland. For 200 years, the Ilseburg foundry was one of the most important producers of pig and cast iron amongst the German states. The hydropower of the Ilse river and the forests were other essential resources of this place. HANS DIETRICH VON ZANTHIER (1717 – 1778), head forester of the counts of Stolberg-Wernigerode, recognized impending exploitation danger for the forests and initiated sustainable restocking programs. The Technical Museum of Ilseburg gives information about the history of the iron foundry and models of how the technology functioned. It also houses a rich collection of ornamental ironcasting from the 16th through the 20th century. In addition, the new Ilseburg Industry Trail and the National Park visitor center Ilsetal are also to be recommended.

Opening hours Technical Museum: Wed – Sat 13 – 16 pm



Tourist-Information Ilseburg
 ☎ 0049 39452 - 19433
 www.ilseburg-tourismus.de

8

In the Fluvial Region of the Holtemme River
Ottofelsen

The Holtemme river drains the north-east Brocken area passing through the towns of Wernigerode and Halberstadt and finally flowing into the Bode river. Starting from Steinerne Renne train station, we accompany the Holtemme river along its main stream up into the mountains. Near the train station of the Harzer Schmalspurbahnen (HSB), we find a historical crane replica demonstrating granite work stone production. We follow the Holtemme through the Steinerne Renne up to the hotel of the same name. On sunny days you can sit on a terrace here and listen to the rushing fall. The waterfall itself is a good example of “retreating erosion”. The granite cliffs, created by the



Ottofelsen



Stone transport wagon of the HSB

effects of weathering, give the valley its wild, romantic character. We leave the valley and follow the signs towards the Lochstein and Ottofelsen. The Lochstein, also “Gebohrter Stein”, is a granite rock exhibiting advanced wool sack weathering so that you can look through the rock. We finally reach the Ottofelsen. Stairs lead upwards to a rock plateau at the top of this rock. As a reward for your efforts, there is a spectacular view of the Brocken and the Harz foreland. For the way back, we choose the forest road in the Thumkuhlen valley. To the left, we soon see an abandoned granite quarry. From here, gravel and rocks were transported by an electric field train to a loading station finished in 1898. From this point we walk along the tracks of the Harzquerbahn, through the Beerberg area where mining also took place. In 1707, Prussia founded the Royal Mining Authority Wernigerode. We soon reach the entrance of the König Friedrich mine, which attests to the fact that King FRIEDRICH II. of Prussia (1712 – 1786) supported the mining business by giving it special privileges.

9

Mining Educational Trail

Lossen Memorial & Thumkuhlen Valley

Short after leaving Wernigerode heading to Schierke, we arrive at the Lossen Memorial on the right hand side. Like the Memorial, the nearby parking space is located near a mining trail providing information on the natural history and geology. In 1896, the memorial was constructed in honour to the geologist KARL AUGUST LOSSEN (1841 – 1893). As a royal district geologist of the Prussian Geological Survey of Berlin and professor at the Royal Mining Academy of Berlin, LOSSEN won recognition for his geological research in the region. All various rocks of the Memorial come from the Harz geological surroundings. Our short trip into the Thumkuhlen Valley starts on a path beginning at the parking place and leading upwards alongside a creek.



Lossen Memorial



Educational trail

Soon we reach a mine entrance, all hidden from view behind a mining waste dump on which an old spruce tree grows. The entrance is evidence of the intense mining activity throughout the Thumkuhlen Valley, which presumably was first initiated in response to the prospect of finding silver and other metal ores in the early 16th century. In the first half of the 17th century, mining here was concentrated on the excavation of cobalt ore (Hasseröder Blau) for production of blue colouring substances. At the end of the 18th century, a flooding of the mine devastated the plant. Further upstream, a demonstration plant with a functioning water wheel was reconstructed. The last phase of the Thumkuhlen Valley mining took place in the 1950's during the "cold war" with a search for uranium. Trace uranium mineralisations had been known in Sachsen-Anhalt since the end of the 19th century. In the Thumkuhlen Valley, uranium minerals were detected in the former cobalt ore mine, but like the other occurrences in the Harz region, the ores proved to be not rich enough and thus spared the Harz the consequence of uranium mining.



Tourist-Information Wernigerode

☎ 0049 3943 - 5537835

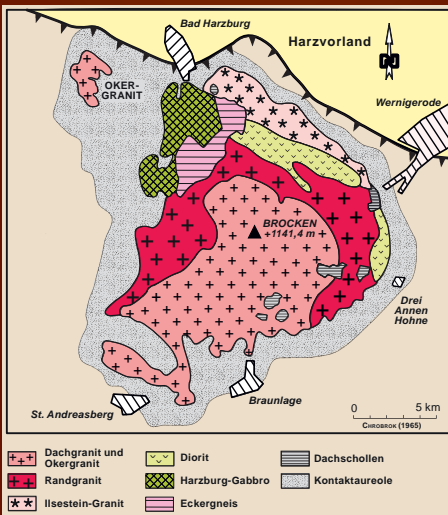
www.wernigerode-tourismus.de



Geological History of the Area

In the course of the Hercynian (Variscan) orogeny, which began in the middle of the Carboniferous, sediments, for the most part marine, were folded, foliated and finally lifted up above sea level as a part of the large Variscan fold belt. As a result of these plate tectonic processes, hot liquid magma rose and became stuck in the rocks of the Harz, where it cooled down. This granite intrusion formed the present Brocken granite, the predominant rock type in the area of Landmark 4. Besides the granite, the Harzburg Gabbro came up as another magmatic rock. These intrusions penetrated and melted the surrounding rocks, provoking a contact metamorphism, through which the invaded rocks are stressed and altered. In the contact zones of the magmas with neighbouring sedimentary rocks, especially hard and resistant rocks known as hornfels developed under the influence of high temperatures. Examples of such hornfels are to be found all around the granite and gabbro rocks. The surroundings of the granite-gabbro massif is primarily composed of marine sediments deposited during the geological periods of the Devonian and the Early Carboniferous over a time span of about 440 to 320 million years ago. They consist above all of slate and greywacke, typical rock types of the Harz. In addition, there are intercalations of chert, sandstone and limestone. In the Devonian (about 390 to 370 million years ago), submarine volcanic eruptions formed the rock named diabase, a paleobasalt. Only as the uplift and the erosion of the overlying sediments began, did the intrusive rocks of the granite and the gabbro came up to the surface. In the wake of these processes, also the

Ecker Gneiss was exposed. The Brocken massif was subsequently thrust up over younger rocks in the region of the northern margin in the course of the uplifting of the Harz, during which the rock beds were steeply elevated and partly overturned.





Selected Points of Information

Restaurants and Accommodations



Hotel Brockenscheideck
Schierke
www.hotel-brockenscheideck.de
☎ 0049 39455 - 268



relexa hotel Harz-Wald
Braunlage
www.relexa-hotel-braunlage.de
☎ 0049 5520 - 8070



Brockenhotel
Schierke
www.brockenhotel.de
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Hotel "Zum Forsthaus"
Altenau
www.hotel.zum.forsthaus.harz.de
☎ 0049 5328 - 401



Restaurant Grimbart's
Braunlage
www.hapimag.com
☎ 0049 5520 - 94310



Wurmberg Alm
Braunlage
www.wurmberg-alm.de
☎ 0049 5520 - 721



REGIONALVERBAND HARZ E.V.

The Regionalverband Harz is a non-profit association. Its full members include the administrative districts of Goslar, Goettingen, Harz, Mansfeld-Suedharz and Nordhausen, as well as the World Heritage-listed city of Quedlinburg. The association's goals are the promotion of art and culture, the care and protection of historical monuments and environmental conservation and landscape management. It further aims to build tolerance in all areas of culture and foster international understanding among peoples and also to preserve local history and traditions. One way, among many, in which these goals are achieved is trusteeship of nature parks in the Harz region. The Regionalverband Harz, with the help of its 130 supporting members, is also responsible for the southern section of the UNESCO-Geopark, which covers an area of 6,202 km².

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